

Application. No. 10/072,592  
Amendment dated April 8, 2004  
Reply to Office Action of January 12, 2004

**REMARKS/ARGUMENTS**

Applicant hereby affirms the verbal election, with traverse, of the claims of Group 1 (claims 1 and 14 - 24) made telephonically by David Banner, Agent for Applicants, on January 2, 2004.

Reconsideration of the above-identified application is respectfully requested in view of the foregoing amendments and the following remarks. Claims 2 - 13 have been withdrawn from consideration. Claims 1 and 20 have been amended. Claims 1 - 24 remain in the case.

The elected claims of the instant application are drawn to a method for activating the membrane-electrode assembly (MEA) of a PEM or similar fuel cell so that, when placed into operation at ambient temperatures and at substantially atmospheric pressure, the performance of the fuel cell is significantly better than performance of a similar fuel cell not undergoing the novel activation process.

Claims 1, and 14 - 24 were rejected under 35 U.S.C. §102(b) as being anticipated by E.A. Ticianelli et al, Methods to Advance Technology of Proton Exchange Membrane Fuel Cells, Journal of Electrochemical Society: Electrochemical Science and Technology, pp. 2209 - 2214, (1988), September. TICIANELLI et al. propose construction and operation of an electrochemical cell having an MEA having similar chemical/catalytic properties as the MEA of Applicants' test electrochemical cell. However, TICIANELLI et al. are completely silent regarding any activation of their electrochemical cell prior to operation, the crux of Applicants' invention as disclosed and claimed.

A comparison of TICIANELLI et al. FIGURE 5, Curves a or b to Applicants' FIGURE 1, Curve A, shows great similarity, as they plot Cell Potential vs. Current Density for different temperature and pressure conditions. Applicant's FIGURE 1, Curve A, shows cell performance BEFORE activation in accordance with the invention. TICIANELLI et al., FIGURE 5,

Curve a, shows cell performance at 1 atmosphere for both H<sub>2</sub>O and O<sub>2</sub> and 50°C operation. TICIANELLI et al., FIGURE 5, Curve b shows cell operation for 3 atmospheres pressure for H<sub>2</sub>O, 5 atmospheres pressure for O<sub>2</sub> and 50°C operation. Applicants' Curve A, on the other hand, shows cell operation of a single test cell at 35°C cell temperature, 45°C hydrogen humidification temperature, and an air humidification temperature of 45°C. While an exact comparison of the two different cells is difficult, (the overall operating temperature of Applicants' cell is somewhat less than the operating temperature of the TICIANELLI et al. cell) Applicants believe that there are enough structural and operating condition similarities to allow such a rough comparison.

However, the important difference to be noted is between Applicants' FIGURE 1, Curve B (i.e., for the same cell operated under the same operating conditions as for FIGURE 1, Curve A, except that the cell has undergone activation), and TICIANELLI et al. FIGURE 5, Curves a or b. As may be readily observed, Applicants' cell performance is significantly different and improved compared to the TICIANELLI et al. cell. The only difference is that Applicants' cell has been activated in accordance with the method of the present invention. In fact, in order to achieve performance similar to that of Applicants' Curve B (still at 35°C cell temperature, 45°C hydrogen humidification temperature, and an air humidification temperature of 45°C), TICIANELLI et al. must operate their cell at 80°C, with hydrogen pressure at 3 atmospheres and O<sub>2</sub> pressure at 5 atmospheres. These are significantly different operating conditions from Applicants' substantially ambient temperature and atmospheric pressures as disclosed and claimed.

Applicants believe that the graphic, albeit inexact, comparisons between TICIANELLI et al. and Applicant's curves performance clearly show the advantageous results of the novel activation process as disclosed and claimed in the instant application. Clearly, Applicants' activated cell operating at substantially ambient temperature and at atmospheric pressure operates in a superior manner to the anticipated performance

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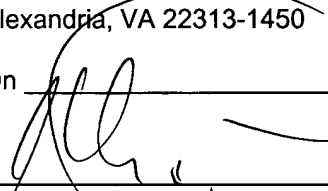
of the TICIANELLI et al. cell under the same environmental conditions.

Claim 1 has been amended to specifically recite the activation step prior to operation of the cell. As amended, claim 1 is now believed to clearly define over TICIANELLI et al., thereby overcoming its rejection under 35 U.S.C. §102(b). Likewise, claims 14 - 24 depending therefrom are now also believed allowable.

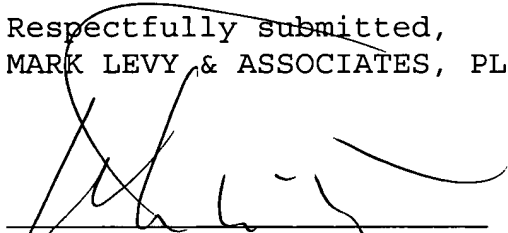
Applicants respectfully request that claims 1 and 14 - 24 be allowed and the application passed to issue.

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4/9/04  
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